9:00

778-3 Percutaneous Carotid Intervention in Patients with Symptomatic Coronary Artery Disease

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Isolated carotid endarterectomy (CE) in the presence of symptomatic coronary artery disease (SCAD) has been associated with high morbidity and mortality. Some suggest pts with coexistent carotid and SCAD should undergo a combined procedure to reduce the morbidity and mortality. To determine whether percutaneous intervention is feasible, we studied 59 consecutive pts (mean age 73 ± 9 years) considered poor CE candidates who presented with SCAD (6 had recent MI, 16 had severe left ventricular dysfunction with unstable or severe angina in 40). Seven pts had contralateral occluded carotids, 14 had bilateral stenosis >70%, 22 presented with transient ischemic attacks, 5 recent hemiplegia, and evolving stroke was present in 1. Carotid stenting was undertaken in 55 internal and 4 common carotid arteries with implantation of 87 Palmaz stents. Procedural success was 100% (including 38 with combined or staged PTCA) reducing the stenosis from 86 ± 7% to 5 ± 2%. There were no deaths, MI or major strokes. One pt had right arm hemiparesis which resolved in 5 days. Most (93%) were discharged within 24 hours. On follow-up (3 ± 2 months), there were no neurologic events or MI although 1 pt died (non-cerebralvascular). Six month angiographic or ultrasound evaluation in 31 eligible pts showed no restenosis or stent deformation. Complete angiographic follow-up will be presented. In conclusion, the high success rate in pts considered poor CE candidates warrants further investigation.

9:15

778-4 Is There a Role for Intravascular Ultrasound in Carotid Artery Stenting?

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A large body of data has corroborated the utility of IVUS in allowing safe stent implantation in the coronary vasculature, with lower rates of vascular complications and stent thrombosis. The role of IVUS in stent deployment to treat obstructive carotid artery disease is less clear. We studied 12 patients undergoing elective carotid artery stenting with IVUS (performed post stent deployment) to assess quantitatively and qualitatively, the success of stent deployment. Quantitative angiography (QA) was performed at baseline; QA and IVUS were performed post stent deployment and adjunctive balloon PTA of the stent, evaluate residual stenosis. Maximal balloon diameter was 6 mm.

Results (mean ± SD):

	Baseline % Diam Sten	% CSA Sten.	Final % Diam Sten	% CSA Sten
QA	77.26 ± 9.28	94.04 ± 4.7	6.74 ± 8.86	12.28 ± 16.34
IVUS	NA	NA	6.91 ± 14.74 (p = 0.9)	9.83 ± 30.01 (p = 0.8)

There was close correlation between final QA derived and IVUS derived measurements of residual % diameter and % CSA stenosis. In two patients, on the basis of IVUS findings of strut non-apposition and significant residual narrowing, neither of which was apparent by QA, repeat PTA was performed, at higher pressure, with improvement by repeat IVUS.

Conclusions:

(1) QA and IVUS measurements of luminal CSA and diameter correlate well after stent deployment in the carotid artery.
(2) IVUS may be helpful in assessing important morphological features of suboptimal stent deployment, not readily apparent on QA.

9:30

778-5 Palmaz Stent Collapse in Patients Following Carotid Artery Stenting

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Carotid artery stenting is currently undergoing investigation as a therapy for the management of cervical carotid bifurcation stenosis. Palmaz stents (Biliary) were deployed successfully in the carotid arteries of 109 patients using high pressure balloon inflations (10 to 16 atm). In 11 out of 52 patients who had 6 months follow-up angiography, stent collapse was noted, which was defined as loss of apposition of part or whole stent to the vessel wall, resulting in alteration of previous cylindrical configuration of a fully expanded well apposed stent. Carotid ultrasound was able to detect stent collapse in only two patients before follow-up angiography. The site of stent deployment were left internal carotid artery in 3, right internal carotid artery in 6 and right common carotid artery in 2 patients. One patient who had crushing of the stent along its entire length was symptomatic at follow-up. Repeat balloon angioplasty was performed in 5 patients, of which three received a Wall stent within the previous stent.

Conclusion: Balloon expandable/crimpable stents have the potential to deform from forces exerted on the cervical carotid artery. A collapsed stent may be a potential nidus for thromboembolism. A self expanding stent in this location appears to be successful in maintaining apposition to the vessel wall.

9:45

778-6 Assessment of Regional Carotid Distensibility With a New Real-Time, Three Dimensional, Ultrasound System

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Regional arterial compliance provides information on vascular changes related to ageing, arterial hypertension and early atherosclerosis, but techniques suitable for clinical use are limited.

Aim of this study was to test in the clinical setting the performance of a real-time 3-D vascular system (Esaote, Italy) for assessing arterial distensibility. Under BP monitoring, 3-D image of common carotid artery (CA) in long-axis is acquired synchronous to ECG with linear probe capable of fan-like movements over an angle of 60º. In the 3-D reconstruction of CA, two regions are selected (2 and 4 cm before bifurcation) to assess regional compliance. Selected regions are displayed as short-axis views either in cine-loop or in each of its 16 frames per cardiac cycle. Thus, changes in regional CA diameter or area during cardiac cycle can be measured, and carotid strain (CS) and cross-sectional compliance (CSC) automatically computed.

The system has been tested on a population including 20 healthy controls (C: mean age 43 ± 18 yy, BP 130 ± 17/70 ± 10 mmHg) and 20 pts with borderline or mild hypertension (HT: mean age 59 ± 14 yy, BP 144 ± 14/77 ± 12 mmHg), out of therapy for at least 5 days. Measurements were performed by two independent observers.

Results: CS and CSC were significantly lower in HT as compared to C (10.8 ± 2.6 vs 16.9 ± 4.9%, $p < 0.01$, and 99.0 ± 38.3 vs 178.2 ± 89.3 $mm^2/10^3$ mmHg, $p < 0.01$). Measurements performed at two different regions of CA did not differ significantly (10 ± 7% and 14 ± 12% for CS and CSC). In C, CS and CSC were inversely related to age ($r = -0.86$ and -0.51, $p < 0.01$ and 0.05), while such a correlation was not present in HT. Intraobserver variability for CS and CSC was 4 ± 3 and 9 ± 6%; interobserver variability was 18 ± 11 and 14 ± 10%.

Conclusions: real-time 3-D vascular system synchronous to ECG shows promising results for assessment of vascular ageing and distensibility in a clinical setting.

779 Echocardiographic Evaluation of Coronary Flow and Flow Reserve

Wednesday, March 19, 1997, 8:30 a.m.–10:00 a.m.
Anaheim Convention Center, Room C2

8:30

779-1 Changes in Coronary Flow Spatial Velocity Profile Demonstrated in Humans by Digital Computer Analysis of TEE Doppler Color Flow

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Transesophageal Doppler (TED) recording of peak axial coronary flow velocity (CFV) within the proximal LAD has been proposed recently as a method for assessing coronary flow circulation. However, in vitro studies have shown that the cross-sectional velocity profile (*Pr*) within small conduits is parabolic at low Reynolds numbers with a ratio of peak axial velocity to mean spatial velocity (R) ≅ 2 and becomes flat (R ≅ 1) when flow velocities increase. Such changes in coronary *Pr* might affect flow calculations derived from CFV recorded by TED. Therefore, using a Vingmed CFM 800 system with an output port for on-line digital data transfer into a micro-computer, we studied proximal LAD *Pr* in 10 pts with normal coronary angiogram (N) at baseline and after 0.56 mg/kg intravenous Dipyridamole in 4 pts (D); *Pr* was also